

Use Of Antiretroviral Drugs Against Vertical Hiv Transmission

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ABSTRACT

HIV-1 and HIV-2 are part of the lentivirus subfamily of the Retroviridae family and are the only ones in their group capable of infecting humans, causing HIV infection and the acquired immunodeficiency syndrome - AIDS. This work has as main objective to analyze the use of antiretroviral drugs in pregnant women with HIV and also to describe the evolution of the use of anti-HIV drugs in the prevention of vertical transmission. 596 articles were found in the PubMed database and 8 in the Scielo database, and subsequently selected, resulting in twelve articles. Although antiretroviral treatments are effective and reduce the morbidity and mortality of the disease, access to diagnosis and therapy is still difficult in many countries - Brazil being an example in free and universal distribution.

KEYWORDS

HIV, Medicines, Vertical

INTRODUCTION

HIV-1 and HIV-2 are part of the lentivirus subfamily of the Retroviridae family and are the only ones in their group capable of infecting humans, causing HIV infection and the acquired immunodeficiency syndrome - AIDS (HARRISON 2018). Transmission can occur through sexual intercourse, transfusion of blood components, vertical (maternal-fetal), or neonatal transmission through breastfeeding, and sharing of syringes and sharps (DUNN et al., 1994). However, it is a sexually transmitted disease - being the most common mechanism of infection (HARRISON 2018).

As for the pathogenesis, the infection occurs when the virus binds to the host cell, this connection usually occurs with the CD4 T lymphocyte with the help of the gp120 protein. The virus fuses the cell membrane and inoculates its content in the cytoplasm of the host cell. Through the enzyme reverse transcriptase, the genetic material of the virus (RNA) is converted into DNA (Deoxyribonucleic Acid). This newly synthesized DNA is transported to the nucleus where a viral enzyme called integrase catalyzes the integration of the viral DNA into the DNA of the host cell. After this process, the viral DNA starts to control cellular metabolism, starting the production of viral RNA and subsequent translation of viral proteins. Viral proteins group together to form polyprotein complexes that, together with viral RNA, move to the cell surface where they become a substrate for the formation of new viruses that spring from the cell membrane. When viruses leave the cell, they take part in the cell membrane as a form of protection against the extracellular environment. For these viruses to become infectious, the protease enzyme present inside them converts polyproteins into proteins and functional enzymes. In this way, the viruses resulting from replication are ready to infect new cells (SOUZA; ALMEIDA, 2003). About vertical transmission, the rate of mother-to-child transmission of human immunodeficiency virus type 1 varies from 5% to 10% during pregnancy, 20% to 30% during delivery and 10% to 20% during breastfeeding absence of treatment, while it is reduced to less than 2% with antiretroviral therapy during pregnancy (KAMADA, 2016).

The drugs currently available for the treatment of HIV infection and AIDS control are divided into five classes of drugs: viral enzyme reverse transcriptase inhibitors (the nucleoside and nucleotide inhibitors of reverse transcriptase being non-nucleoside reverse transcriptase inhibitors), inhibitors integrating viral enzyme, viral protease enzyme inhibitors and fusion inhibitors - which interfere with virus access (ERRANTE et al., 2018).

Brazil has committed itself to the United Nations (UN) Millennium Development Goals, to combat and reverse the current trend of the spread of HIV / AIDS and by 2020 having 90% of people diagnosed with HIV; of which, 90% must be under treatment; and among these, 90% have an undetectable viral load (BRASIL, 2017). Accordingly, after the establishment of the right to free antiretroviral medication by the Unified Health System in 1997, the country became one of the main examples of prevention (PIOT; COLL SECK, 2001). The rate of mother-to-child transmission of human immunodeficiency virus type 1 varies from 5% to 10% during pregnancy, 20% to 30% during delivery and 10% to 20% during breastfeeding without treatment, whereas it is reduced to less than 2% with antiretroviral therapy during pregnancy (KAMADA, 2016). Considering the information available, this work aims to analyze the use of antiretroviral drugs in pregnant women with HIV and also describe the evolution of the use of anti-HIV drugs in the prevention of vertical transmission.

METHODOLOGY

An exploratory study will be carried out through a literature review.

Articles from the SciELO and PubMed databases were selected using the keywords "Acquired Immunodeficiency Syndrome", "Vertical transmission of infectious diseases" and "Pregnancy". 596 articles were found in the PubMed database and 8 in the Scielo database. Those published in the last 5 years were filtered, resulting in 24 and 4 articles, respectively. Articles in Portuguese and English were used, all available online in full text.

The data collection was systematized in 3 stages: The first was the exploratory reading of the selected material after the application of the descriptors and the determined period. This first contact aimed at selecting articles with a similar theme. The stage resulted in the exclusion of 10 articles. Selective reading was the second step. Through it, it was possible to deepen the reading in the articles that focused in line with the objectives of the study. This selection resulted in the exclusion of 6 articles. The third step was the registration of information obtained in tables containing the following variables: authors, year, method, results, and conclusions.

After organizing the information obtained, analytical reading was carried out to organize and summarize them. In this way, articles that addressed similar approaches were separated and grouped.

The groups resulting from the analytical reading were discussed and compared according to what was observed in the theoretical framework on the theme.

RESULTS AND DISCUSSION

Bick, et al (2018) found, through an integrative literature review, that the intervening factors in the feeding of infants exposed to vertical transmission of HIV are classified into three categories. The first deals with the individual character of each family, including their beliefs and desires. The second enters the social sphere, such as socioeconomic level, social support and stigma. The third, however, permeates the field of politics, that is, how the health services frequented by the family are structured and what orientations and care were provided by the professionals. The article concludes that these factors can occur independently or associated with each other. Therefore, they must be minimized in order to ensure adequate nutrition and protection for infants.

The literature review carried out by Powis, et al (2017) aimed to ascertain in the existing scientific literature whether there are differences in health and growth conditions between HIV-negative children exposed to HIV and ART and those not exposed. Some

studies have pointed to adverse outcomes at delivery, difference in linear growth and increased infectious morbidity. Neurodevelopment is also a questionable point. The article raises some obstacles for a reliable analysis of the children's health situation, since most of them are in sub-Saharan regions, where the diagnostic methods are not yet standardized. Another limiting factor is the possible relationship between childhood illnesses and the precarious living conditions that still plague the population of the countries most affected by HIV. Studies by Nordeling (2016) reveal that children exposed to HIV-positive but uninfected mothers tend to have more impaired health and a higher risk of death than those born to mothers without the virus. However, the studies are conflicting, as other publications do not show such evidence.

Melo, et al (2016) carried out an ecological study of temporal tendency to evaluate the coefficients of incidence and mortality in children under 14 in the region of Porto Alegre and Rio Grande do Sul from 1996 to 2012. In this study, it was contacted that, in POA, 59.1% of cases occurred in children under 4 years old. During the period, in the same city, mortality fell from 9 to 2 in 100 thousand children, a reduction seen mainly in children under 1 year. Such a fall may be related to the implementation of prevention and treatment of pregnant women. The involvement of children aged 10 to 14 years was 15% of the total number of cases, constituting the only age group that did not show a decrease in the mortality coefficient. Factors possibly associated with this rate are: drug use, homelessness and low education.

In spite of this, genetic studies by Kamada, et al. (1999), pointed out that the bone marrow stromal cell antigen transmembrane protein (BST-2 / Tetherin) prevents the release of HIV-1 particles by retaining the virus in the membranes infected cells. They evaluated the role of this antigen in the susceptibility of maternal transmission of HIV-1, positively concluding its protective role and deserving of this theme more in-depth studies. Afolabi, et al (2018), in a cohort study carried out with 60 pregnant women in Nigeria followed up for 1 year, found the mothers' mean age of 32, 9 years. Of all 44 infants examined, 2 were seropositive by DNA PCR techniques. Children of mothers living in rural areas had 3.39 times more risk of vertical transmission of HIV when compared to residents of urban areas. Furthermore, those born at home were 2.9 times more likely to have vertical transmission than those born at health facilities.

Darak, et al (2014) compiled the recently used approaches for providing antiretrovirals to pregnant women and all aspects involved in this process, including the barriers faced in accessing the health service. The review concluded that coverage of the vertical transmission prevention program is still heterogeneous around the world, being almost 90% in Eastern, Central and Caribbean Europe and less than 20% in Asia, Africa, the Pacific and the Middle East. It was also found that a high number of women is lost among the stages of the service cascade of the vertical transmission prevention program. The first step in the care cascade is access to HIV testing during pregnancy, which is still handicapped due to both lack of access and social issues, such as prejudice. The second step is the start of ART. The main obstacles encountered at this stage are the scarcity of financial and material resources and personal denial of treatment. A possible ally in breaking social barriers is the inclusion of the community, family and partners in the stages of diagnosis and treatment. Another strategy for improvement to improve the vertical transmission program is its insertion in sexual and reproductive health services, since both approaches have the same target audience. Liotta et al., Analyzed the benefits of administering combined antiretroviral therapy to women living with HIV during pregnancy and breastfeeding. They concluded that antiretroviral therapy is capable of reducing vertical transmission, as well as maternal mortality and infant mortality in HIV-infected populations and to levels similar to those of uninfected individuals.

Regarding the prevention of vertical transmission, the involvement of the partner, family and community play a vital role in providing physical, emotional, social and financial support for women living with HIV (SEWNUNAN, 2015). However, the study did

not lead to reliable results that can be generalized to other areas, due to the educational limitations of patients at the study site.

Mushamiri, et al. (2015) assessed the impact of using a mobile health system on adherence to treatment and prevention of vertical HIV transmission in Kenya. The mobile system works with the aid of cell phones or tablets. The screening of pregnant women with HIV became more efficient, as the registration started to be done electronically, so the data of the patients became more accessible to all CHAs. This ease of access made it possible for CHWs to schedule prenatal appointments in advance and remind pregnant women to attend.

As for studies to analyze health education, according to Chen, et al. (2015), in an 18-year period of surveillance and prevention in a Chinese province, it was found that women, on learning that they have HIV, are less likely to have children. They, due to the high level of schooling, had knowledge about the possibility of HIV transmission to the fetus and therefore chose not to have children. According to Elsheikh, Crutzen and Borne (2015), in a research in Sudan, when women were questioned about the importance of HIV testing during pregnancy, they stated that they thought it important because it would represent a chance to save the fetus if the mother was infected. However, among women who did not find the test important, almost all said the test was just an additional burden of anxiety and worry.

CONCLUSION

Vertical transmission of HIV is still a worldwide reality. However, the largest number of studies on the theme related to the African continent was noticeable, requiring research that addresses the Brazilian reality. It was also noticed that the socioeconomic level of patients living with HIV during pregnancy interferes with the understanding, prevention and treatment of the disease. Although antiretroviral treatments are effective and reduce the morbidity and mortality of the disease, access to diagnosis and therapy is still difficult in many countries - Brazil being an example in free and universal distribution.

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